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Construction Health And Safety Plan For The East Trenches Plume Project

February 9 1999
Revision 1

RF/RMRS-98-298

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Rocky Mountain Remediation Services, L.L.C.

February 1999
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APPROVAL SIGNATURES

OHM Project Manager: _____ Date: 2/11/99

OHM Safety Manager: _____ Date: 2/10/99

RMRS Project Manager: _____ Date: 2-10-99

RMRS Health and Safety. _____ Date: 2-10-99

RMRS Radiological Engineering _____ Date. 2/10/99

RMRS Quality Assurance _____ Date: 2/10/99

APPROVAL SIGNATURES

OHM Project Manager _____ Date _____

OHM Safety Manager Richard F. Barnes Date 2/10/99

RMRS Project Manager Annette Primrose Date 2-10-99

RMRS Health and Safety E S Chandler Date 2-10-99

RMRS Radiological Engineering A W Estabrook Date 2/10/99

RMRS Quality Assurance Gregg D D Burgess Date 2/10/99

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1 0 INTRODUCTION

This construction health and safety plan (CHASP) establishes the procedures and requirements that will be used to minimize health and safety risks to persons involved with the construction of the reactive barrier for the East Trenches Plume Project (ETPP) The plan contains information about the hazards involved in performing the tasks and the specific actions and equipment that will be used to protect persons working at the ETPP during installation of the East Trenches Plume Treatment System (ETPTS)

This CHASP will govern all work (including inspections) at ETPP performed by employees of OHM Energy Services (OHM), Rocky Mountain Remediation Services, L L C (RMRS), and OHM subcontractor employees

1 1 Scope of Work

The ETPP involves the installation of an reactive iron system for collection and treatment of the ETGP The East Trenches Plume Treatment System (ETPTS) consists of a subsurface barrier, a long-term monitoring system, and a treatment system including treatment media identified in development studies The following sections briefly review the procedures for installing the ETPTS Details of system installation can be found in the Field Implementation Plan Work associated with this project will be performed during daylight hours, Monday through Thursday from 0700 to 1700

OHM will mobilize the field crew, health and safety materials, vehicles, and small equipment primarily from the office in Denver, Colorado All heavy equipment, support equipment, and subcontractor services will be obtained from vendors in the local area Key personnel for the project include the Project Manager, Safety Professional, the Safety Designee, Project Superintendent, and field labor

Prior to initiating construction operations, the following site preparation activities will be performed

1. Site-specific training will be required for all site personnel and site badges will be secured
2. All site personnel will provide certificates of OSHA training Personnel will also receive training, as applicable, on equipment to be utilized during the execution of the project Certification of training will be provided to RMRS upon request by the CTR
3. A pre-construction meeting will be held with all project personnel The meeting consists of an explanation of DOE procedures, points of contact throughout site activities, and review of the CHASP, including all applicable Activity Hazard Analyses (AHAs) (See Section 2)
4. Necessary work permits will be obtained in coordination with RFETS personnel (i e , fire department, excavation, building and zoning, plumbing, electrical, and environmental)
5. Temporary facilities such as storage trailers, sanitary facilities, parking areas, personnel and equipment decontamination areas, areas for storage of construction materials, and areas for staging (containing) construction wastes will be established Radio and/or cellular phones will be used on-site

6 Site security will be established and will consist of temporary construction barrier rope Traffic control measures will be established
7 Work zones will be established

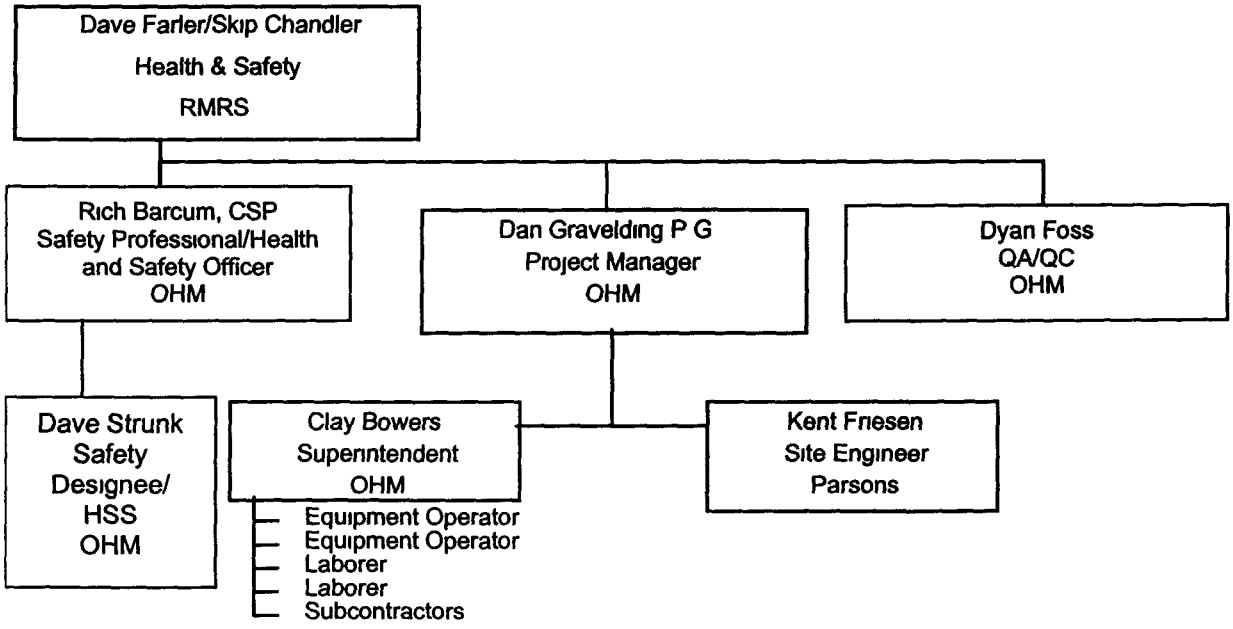
The barrier wall alignment and the treatment system locations will be surveyed prior to performing any intrusive activities Control points will be established outside the work area and referenced during installation of the ETPP to ensure all elevations are per the design specifications There will be no intrusive activities performed as part of the site survey task

The first 12 inches of surface soils will be scraped from the work area Topsoil will be stockpiled and segregated from other soils for reuse as top cover

One (1) 48-inch collection sump will be located on the up gradient side of the barrier wall approximately midway between the ends of the barrier wall The sump will be constructed of high density polyethylene (HDPE) and will be pre-constructed off-site The collection sump will be engineered so that it will classify structurally as a confined space to allow personnel entry into the sump for service or maintenance An area approximately five feet by seven feet will be excavated and shored using an approved shoring system in preparation for the collection sump Prior to lowering the collection sump into place approximately two feet of bentonite/crushed stone will be placed at the bottom of the excavation The collection sump will be backfilled with the same backfill material used in the trench

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

2.1 Organization Chart



2 2 RMRS Construction Safety and Health Oversight Responsibilities

Provides Safety and Health oversight and direct support for RMRS construction, (includes demolition, and environmental) subcontracts Support and oversight activities include but are not limited to the following

- Reviews in conjunction with Project Management, Site Specific Safety and Health Plans (SHP)'s, Preliminary Phase Hazard Analysis (PHA)'s, and Activity Hazard Analysis (AHA)'s when required
- Provides safety and health oversight and conducts impromptu and formal field Safety and Health surveillance /inspections of construction activities for site contractors and subcontractors of all tiers
- Conducts cursory compliance inspections of construction subcontractor (all tiers) and vendor mobile cranes, hoisting & rigging equipment, and heavy construction equipment brought to site
- Attends Project Status Meetings and provides problem solving assistance to Construction Management for application of Safety and Health standards and requirements during field construction activities
- Performs accident or incident investigations as required

2 3 OHM Project Manager Responsibilities

The OHM Project Manager for the ETPP has overall responsibility for work performed by OHM personnel and any subcontractors at the site The Project Manager, through line management and supervisors, has responsibility for implementing and abiding by the CHASP

2.4 OHM Project Superintendent Responsibilities

The Superintendent is responsible for overall safety and health during the performance of the construction activity This person will be present on-site during the performance of construction work and will ensure that provisions of this CHASP and the requirements of the OHM Safety and Health Program are fully implemented The Superintendent manages field operations, executes the Field Implementation Plan (FIP), and is ultimately responsible for the safe and successful completion of the project The Superintendent also enforces site control, documents task site activities, and conducts daily safety briefings at the start of the work shift The Superintendent will also interface with the Contractor's Technical Representative (CTR) and Safety Professional or Safety Designee to ensure that project goals are being met and that health and safety issues involving the site are addressed

2 5 Safety Professional Responsibilities

The Safety Professional is responsible for managing the safety and health programs on numerous construction project sites The Safety Professional is responsible for ensuring that Health and Safety Specialists/Safety Designees are adequately fulfilling their roles and responsibilities The Safety Professional is OHM's primary source of information regarding

radiological hazards at the task site The Safety Professional may assume the responsibilities of the Safety Designee as conditions warrant

2 6 Safety Designee/HSS Responsibilities

The Safety Designee is the primary source of information regarding non-radiological hazardous and toxic agents at the task site The Safety Designee assesses the potential for worker exposures to hazardous agents in accordance with OHM procedures The Safety Designee recommends appropriate hazard controls for protection of task site personnel, reviews the effectiveness of monitoring and Personal Protective Equipment (PPE) required in this CHASP, and recommends changes as appropriate Following an evacuation, the Safety Designee will assist in determining whether conditions at the task site are safe for reentry Employees showing health effects resulting from possible exposure to hazardous agents will be referred to the Occupational Medical Program (OMP) by the Safety Professional or Safety Designee The Safety Designee may also have other duties at the task site as specified in other sections of this CHASP or OHM procedures and manuals Because of the possibility non-radiological hazards will be encountered during this investigation, the Safety Professional will assign a Safety Designee to perform monitoring at the task site as conditions warrant

The responsibilities of Safety Designee will include but not be limited to

- Implement the CHASP, attend pre-work conferences, and conduct all construction site safety and health orientations and/or briefings
- Document weekly construction safety meetings and daily pre-activity work plan or hazard review meetings
- Perform or oversee performance of any required monitoring for construction site physical, chemical, or biological hazards
- Perform daily project safety and health inspections of the construction site, recording hazards found and corrective actions taken in a permanent log Provide for immediate identification, documentation, abatement and/or resolution of hazards/deficiencies or safety and health rule violations noted during construction activities
- Ensure the prompt and complete reporting of all construction site accident and incident investigations, and provide appropriate reports to the CTR within the required time frame
- Maintain all required construction activity Health and Safety statistical information and provide monthly to the CTR all information stipulated on the "Monthly Contractor Injury and Illness Statistics" Report, pertinent to employee hours worked, Computerized Accident Incident Reporting System, and OSHA Incidence Rates for construction work performed on-site by the OHM, Lower-tier Subcontractors and Vendors

2 7 Task Site Personnel Responsibilities

All task site personnel having business at the ETPP, regardless of company affiliation, are responsible for understanding and complying with requirements of this CHASP Task site

personnel will be briefed by the Project Superintendent or Safety Designee at the start of each shift Task site personnel should identify potentially unsafe situations or conditions to the Project Superintendent, or Safety Designee for corrective action If unsafe conditions develop, task site personnel are authorized to stop work and notify the Project Superintendent, or Safety Designee of the unsafe condition

2.8 Lower-Tier Subcontractor Responsibilities and Control

OHM subcontractors are required to comply with all applicable requirements and guidelines, including pre-construction briefings and training OHM shall be responsible for safety and health performance of lower-tier subcontractors and vendors

2.9 Radiological Control Technician Responsibilities

RMRS will provide Radiological Control Technician (RCT) coverage as required In the event radiological contamination is identified, an RCT will be present at the task site

Responsibilities of the RCT include radiological surveying of the task site, equipment, and samples, providing guidance for labeling and transporting radioactive samples (if any), providing guidance for radiological decontamination of equipment and personnel, and accompanying the affected personnel to the nearest RMRS medical facility for evaluation if significant radiological contamination occurs The RCT must notify the HSO or CSS of any radiological occurrence that must be reported as directed by the Radiological Operation Instructions (ROI) The RCT may also have other duties at the task site as specified in other sections of this CHASP or Company procedures and manuals The RCT will meet the qualification established by the RFETS

2 10 OHM Quality Assurance/Quality Control (QA/QC)Inspector Responsibilities

OHM QA/QC Inspectors are responsible for for understanding and complying with requirements of this CHASP QA/QC Inspectors will be briefed by the Project Superintendent or Safety Designee at the start of each shift QA/QC Inspectors should identify potentially unsafe situations or conditions to the Project Superintendent, or Safety Designee for corrective action If unsafe conditions develop, QA/QC Inspectors are authorized to stop work and notify the Project Superintendent, or Safety Designee of the unsafe condition

2 11 Engineer Responsibilities

OHM Engineers are responsible for understanding and complying with requirements of this CHASP Engineers will be briefed by the Project Superintendent or Safety Designee at the start of each shift Engineers should identify potentially unsafe situations or conditions to the Project Superintendent, or Safety Designee for corrective action If unsafe conditions develop, Engineers are authorized to stop work and notify the Project Superintendent, or Safety Designee of the unsafe condition

3 0 PERSONNEL TRAINING

3 1 Pre-Construction Safety and Health Orientation

All personnel reporting for work at the construction site shall attend a documented pre-construction safety and health general orientation conducted by the CSS or HSO The orientation shall emphasize that no employee will be required to work in conditions that are unsanitary, hazardous, or dangerous to their safety or health, and that accident prevention shall be the responsibility of each individual on the construction site The employees will be advised of their safety and health rights (a work place free from recognized hazards with a procedure to make hazards known to management) and their safety and health responsibilities (to work in a safe manner) The safety and health orientation shall at a minimum address the additional following points

- Employee rights and responsibilities, and location of DOE form F5480 4 "Complaint Form"
- OHM, Lower-Tier Subcontractor and/or Vendor responsibilities
- The location of approved Project Health and Safety Plan available for review by employees
- First aid and medical facilities
- Emergency response procedures to include local warning, evacuation, and sheltering
- Specific Occupational Safety and Health programs or procedures applicable to the construction activities
- The Hazards Communications Program
- Employee access to exposure monitoring data and medical records
- General project hazards and the applicable policies and procedures for addressing these hazards
- Construction hazard recognition and the procedures for reporting or correcting unsafe conditions
- Use and maintenance of PPE
- Procedures for reporting accidents or incidents
- Fire prevention and control
- Alcohol and drug abuse policy
- Disciplinary procedures for safety infractions or violations
- Documentation of all pre-evolution briefings shall be included in IWCP at all times

Site specific safety and health requirements may vary from construction project to construction project Employees with a continued on-site presence or those working on multiple construction projects may be provided with a general construction safety and health orientation of the items referenced prior to the commencement of the initial construction activity, and at least annually thereafter Orientation on items that vary from project to project shall be provided for each project The CTR or HSO reserves the right to require and provide additional construction safety and health orientation topics for inclusion in the Health and Safety orientations

3 2 Construction Bulletin Board

To promote and maintain a highly visible safety profile on the work-site, each construction project shall establish a Safety Bulletin Board Bulletin boards will be at the break trailer where

they are readily accessible and may be easily read by employees and visitors to the work-site Bulletin boards will be of sufficient size to accommodate the following postings

1 Project Information Card
2 Appropriate required OSHA, Colorado Worker's Compensation Posters
3 Appropriate safety posters and safety information signs (e g , PPE requirements for the work area)

3 3 Worksite and Task Specific Training

All personnel, regardless of company affiliation, assigned to the ETPP must complete the training required by OSHA as well as site-specific health and safety training courses required by RMRS The ETPTS is classified as a hazardous waste operation by OSHA standard 29 CFR 1926 65, therefore, the training requirements, including the initial training, annual refresher training, and supervisor training, apply to personnel working at the site Additional training courses required by RMRS include General Employee Training Depending on the task for individual employees, specific training may be required, including, annual Hazard Communication training, confined space entry training, and fall protection training

3.4 Daily/Weekly Pre-Work Meetings

Daily pre-work safety briefings (Tailgate Safety Meetings) for project site employees shall be conducted and documented by the Superintendent or Safety Designee The briefings will address the day's planned activities and any pertinent safety and health information the supervisor determines to be applicable and will serve as a daily reminder of safety responsibilities The length of the pre-work safety briefings will vary depending on the complexity of the day's tasks

Documented construction safety and health meetings with mandatory attendance shall be conducted on weekly basis for all project site employees Each meeting will be conducted by the Safety Professional A formal outline of the meeting shall be maintained at RFETS and copies of the outline shall be furnished to the CTR within 24 hours of the meeting Meeting minutes will be documented and attached to the roster

4.0 SITE SPECIFIC REQUIREMENTS COMPLIANCE

4.1 Personal Protective Equipment

PPE will be selected and supplied based upon the nature of the hazards present The following are minimum PPE requirements for the ETPP Additional, PPE is stipulated in the Activity Hazard Analyses

- Hardhats will be worn by all personnel in the construction area All hardhats shall be ANSI Z89 1 approved Crane and heavy equipment operators working under rollover protective structures in an enclosed cab are exempted from this requirement **while in the cab only.**
- Eye protection shall be worn by all personnel in the construction area All hardhats shall be ANSI Z87 1 approved industrial strength eye protection with side shields Dark tinted lenses shall not be worn during the hours of darkness or within buildings, enclosures or structures

- ANSI Z41 1 approved over the ankle leather work boots shall be worn by all personnel in the construction area Concrete demolition and earth compacting utilizing equipment with a drive piston shall be conducted with metatarsal protection
- Work clothing consisting of long pants and shirts that cover the shoulders with a minimum of 4 inches of sleeve shall be worn by all personnel in the construction area
- All personnel working on or near a roadway or heavy equipment shall wear high visibility vests

4 2 Ladders

All ladders shall be rated Class 1-A Industrial Extra Heavy Duty Metal ladders will not be used when electrical hazards are present or in close proximity The use of three-legged ladders is prohibited

4.3 Seatbelts

Seatbelts shall be worn while personnel are riding in motor vehicles and by equipment operators when operating heavy equipment

4 4 Imminent Danger

All project personnel have the authority and responsibility to stop work activities, without fear of retribution, in the event of imminent danger

4.5 Cursory Equipment Inspections

All lifting and earthmoving equipment shall be inspected upon arrival on site and every day prior to use Additionally, RMRS Safety will conduct cursory inspections of lifting and earthmoving equipment prior to its use on site Pursuant to OHM agreement with RMRS Safety this inspection may take place at the site, provided that the equipment is not utilized until approval is granted by RMRS Safety

4.6 Flammable and Combustible Liquids

Only approved metal safety cans shall be used for the handling, use and storage of flammable and combustible liquids in quantities greater than one gallon The original container or approved metal safety cans shall be used for quantities of less than one gallon Approved metal safety cans shall be in good repair, equipped with a spring loaded closing device, flame arrestor, and be properly labeled Except when in use, all flammable and combustible liquids shall be stored in an approved flammable material storage cabinet

4 7 Portable Generators

Portable generators shall have externally grounded frames or certification to document the manufacturer's test data

4 8 Ground Fault Circuit Interrupters

Ground fault circuit interrupters shall be used in conjunction with all 125 volt (nominal), single phase, 15-,20-, and 30- ampere receptacle outlets

4 9 Modification of Tools and Equipment

Tools and equipment will not be fabricated or modified during the execution of this project

4 10 Demarcation of Construction Areas

Due to the possibility for high winds on site, the construction area will be demarcated utilizing construction rope with yellow caution tape placed at 20 to 25 foot intervals The demarcation shall include postings of minimum PPE requirements visible at all entrances to the construction area to alert personnel

4 11 Housekeeping

Housekeeping shall be maintained on an ongoing basis OHM will control debris at all times to avoid debris from becoming wind blown across the site

4 12 Energy Isolation and Lockout/Tagout

All energy isolation shall be performed in accordance with Site lockout/tagout procedures No energized work will be performed

4.13 Unusual and Unexpected Conditions

In accordance with the RMRS Safety and Environmental Stewardship Directive, OPS-DIR-001 requires that project personnel

"Adequately address unexpected hazards or conditions encountered during environmental restoration, waste management, and decontamination's and decommissioning activities In the event unanticipated hazards or conditions are encountered, the project activities will pause to assess the potential hazard or condition The potential hazard or condition will be evaluated to determine the severity or significance of the hazard or condition and whether the existing project controls are sufficient to address the hazard or conditions Based on this initial evaluation, a determination will be made whether to proceed with the controls currently in place, segregate the condition or hazard from the project activity, if this can be done safely, or curtail operations to address the unexpected hazard or conditions Concurrence to proceed down the selected path must be obtained from the respective RMRS director or their designee "

In the event of adverse weather conditions such as high winds, lightning or other inclement weather, OHM shall limit or curtail activities as appropriate Sustained wind speeds between 30 and 45 mph require that all work on roof tops and elevated surfaces be suspended and evaluated by the Safety Professional prior to work continuing For sustained winds at or above 45 mph, all outside work shall be stopped Sustained winds in excess of 55 mph require that all employees be sheltered in permanent structures Dust suppression will be instituted at continuous wind speeds above 15 mph

4 14 Spill Control

The use of appropriate spill controls measures will be utilized A containment system will be appropriately designed for fuel storage tanks

4 15 Health Hazard Monitoring and Medical Surveillance

Personnel will participate in an Medical Surveillance Program as required by 29 CFR 1926 65 All subcontractors are required to provide medical surveillance for employees working in the ETPP and to provide acknowledgment of such surveillance per 29 CFR 1926 65 Radiological internal dosimetry is required for individuals meeting the requirements under the ROI

The policy of the RMRS OMP is to examine all workers, including subcontractors, if the workers are experiencing symptoms consistent with exposure to a hazardous material, or there is reason to believe they have been exposed to toxic substances or physical agents in excess of allowable limits

4 16 Job Site Safety and Health Inspections

Daily safety and health inspections shall be conducted of the worksite by the Safety Professional or Safety Designee Safety and Health deficiencies will be corrected immediately and recorded in a permanent logbook

4 17 Chemical Control

Material Safety Data Sheets shall be maintained for all hazardous chemicals All hazardous chemicals shall be properly labeled and stored An inventory list of all chemicals on the projects shall be continually updated and maintained on site Workers shall receive Hazard Communication training for the chemicals they will use or may be exposed to on site

4.18 Emergency Response

This CHASP has been developed to allow site activities to be conducted without adverse impact on the safety of the worker, the community, and the environment Procedures included in this section address the action required in the event of extraordinary conditions that might occur at the site

During site-specific orientation and at daily safety meetings, all employees will be trained in and reminded of the provisions of this emergency response plan, the communication systems, and evacuation routes This plan will be reviewed and revised, if necessary, on a regular basis This will ensure that the plan is adequate and consistent with prevailing site conditions

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LIFE-THREATENING EMERGENCIES
CALL EXTENSION 2911

NON LIFE-THREATENING EMERGENCIES
CALL EXTENSION 2914

Notification requirements for emergency situations at ETPP depend on the nature of the perceived emergency (e g , spill injury, fire) and the extent to which the damage and/or injuries have progressed Upon discovery of a release of materials or other non life-threatening emergency situation, the Shift Superintendent will be notified at extension 2914 If there is no answer at 2914, refer to 2911 If the situation is life-threatening, Rocky Flats Plant (RFP) emergency response personnel will be notified as detailed below

Call Extension 2911 to obtain emergency assistance for life-threatening emergencies and to simultaneously access the following

- Emergency Coordinator (EC), Shift Superintendent
- Plant Protection Central Alarm Station
- Fire Department Dispatch Center
- Medical Department

As much detail about the emergency as possible shall be provided A decision to dispatch any or all of the following equipment will be based on the provided information

- Fire Engine
- Ambulance
- Hazardous Material (HAZMAT) Response Vehicle

Provide the following information, upon request, to the Emergency Dispatcher

- Informant's name
- Exact location of the emergency
- Nature of the emergency
- Condition of the patient if applicable (breathing, consciousness, bleeding, etc)
- Special hazards in the area
- Any other information requested

If no details are given, emergency response personnel will respond automatically

The EC will respond immediately to emergencies The RFP Protection Central Alarm Station will activate the Building Emergency Support Team by the Life Support/Plant Warning Public Address System The EC will activate the Emergency Operation Center and notify departments that have an advisory role in the situation, if applicable The EC will determine whether additional help from off-site agencies (e g , police, hospitals) is required

The EC will also notify the following groups when appropriate

- Radiological Engineering
- Industrial Hygiene
- Occupational Safety
- Waste Operations
- Waste Programs
- Traffic
- Occurrence Notification Officer
- Health and Safety Administrator

Emergency Contact Telephone and Pager Numbers

Fire	x2911
Ambulance	x2911
Poison Center	629-1123
Security	x2911

Emergency Contact Telephone and Pager Numbers

Fire	x2911
Ambulance	x2911
Poison Center	629-1123
Security	x2911

Additional Project Telephone Numbers

Safety Team Lead – Skip Chandler	x6673
Health and Safety – Dave Farler	x4340
Project Manager - Annette Primrose	x4385
Field Manager – Mike Bemski	x4090
H&S Supervisor – Tony Medina*	x5830
OHM Project Manager - Dan Gravelding	303-793-5278
OHM Health and Safety Officer – Rich Barcum, CSP, CHMM	x7892
OHM DOE Program Manager – Jay Green	x5834
OHM QA/QC – Dyan Foss	x7577

* H&S Supervisor is only to be called if other health and safety personnel are unavailable

The response to and abatement of most emergency situations from the ETPP will require the expertise of RFP emergency response personnel Situations that will require the assistance of RFP emergency responders include, but are not limited to the following

- Accidents resulting in physical injury,
- Accidents resulting in radiological exposure,
- Incidents where the substance cannot be absorbed, neutralized or otherwise controlled at the time of release,
- Situations where there is a potential for safety or health hazards,

REPORT TO THE EC AT EXTENSION 2911 all spills where the substance cannot be absorbed, neutralized, or otherwise controlled at the time of release, or where there is a potential for safety or health hazards (fire, explosion, chemical, or radiological exposure) The EC will dispatch the HAZMAT Response Vehicle and any other necessary support personnel
Spills that do not require a HAZMAT response shall be cleaned up by site personnel according to an approved RMRS SOP Spills onto porous ground will require removal of contaminated dirt as well as the spilled material and are expected to be classified as hazardous waste and are reportable

Fire extinguishers will be located in all field vehicles and will be temporarily located at sites where there is a potential for fires (e g , during welding operations)

Personnel and visitors to ETPP will evacuate the area if any of the following occur

- If an emergency (such as a fire or chemical spill) develops
- If instructed by site supervision
- If instructed by the Shift Superintendent over the site radio or telephone system

After an evacuation, each Supervisor will verify that the employees that he/she supervises are accounted for

The evacuation routes will be posted at the site and procedures will be reviewed with the field personnel by the HSO prior to the start of work The waste water treatment plant located to the north of the ETPP will be used as an assembly area

Radios will be used by field personnel to maintain contact with the Superintendent or other designated persons in the trailers who have access to telephones The Safety Designee or Superintendent will monitor the radio frequency in use by field personnel at all times during field operations At least one radio will be onsite during construction hours More radios may be issued to other personnel as needed

Construction site personnel will be briefed during initial orientation on the Emergency Response Plan and participate in any rehearsals conducted by RMRS Emergency Preparedness, unless specifically exempted by RMRS

In the event of a known or suspected injury or illness caused by exposure to a hazardous substance or physical agent, the Superintendent and Safety Professional will be notified Additionally, the worker(s) will be transported to the RFETS medical facility for evaluation, accompanied by the Safety Designee or Safety Professional and the Superintendent

Further medical evaluation will be in accordance with the symptoms, hazard involved, exposure level, and specific medical surveillance requirements

All injuries, regardless of severity, will require the person to report to Occupational Medicine for evaluation All injuries require that an Individual Accident/Injury Form (DOE 5484 3) be completed and distributed within 24 hours of the injury OSHA Recordable injuries additionally require the completion of an OSHA Reportable Injuries Form (Form 101) The OHM Safety Professional will determine OSHA recordability for all injuries to OHM personnel The OHM Safety Professional will maintain the OSHA 200 Log for the project **All** accidents, injuries and near misses must be reported immediately to the Superintendent, Safety Professional and the CTR The OHM Superintendent, with assistance from the Safety Designee or Safety Professional, will conduct a thorough, documented, investigation of all accidents, injuries and near misses

5 0 ACTIVITY HAZARD ANALYSIS

As part of the Integrated Safety Management System, all Activity Hazard Analyses will be walked down and reviewed with the individuals performing the work Any changes or modifications will be addressed at this time and submitted as required

PPE will be determined based upon the hazards present Upgrades and downgrades of PPE will be determined based upon visual inspections of the work activities and air monitoring results Upgrades to Modified Level D will be based the potential for exposure When an action level of one half of the Permissible Exposure Limit is reached, a decision whether to upgrade to respirator use (Level C) will be made This determination will be made based on the potential to exceed the whole Permissible Exposure Limit and therefore respirator use may or may not be required at this action level

	Title/Description East Trench Plume Project	Date January 16, 1999
Company/Organization OHM Energy	Location East Trench, East of PA	Department Groundwater Remediation

Level D	**Mandatory Equipment** Hardhat, Safety Toed Boots, Safety Glasses, Long Sleeved Shirts, Pants, Reflective Vests	**Optional Equipment, as Needed** Cold weather Gear, Gloves, hearing protection, fall protection equipment, rain gear, goggles, splash shield, welding gloves, cape or chaps
Modified Level D	**Mandatory Equipment** Hardhat, Safety Toed Boots, Safety Glasses, Long Sleeved Shirts, Pants, Reflective Vests, Tyvek, Poly Coated Tyvek or Saranex Coveralls	**Optional Equipment, as Needed** Cold weather Gear, Gloves, hearing protection, fall protection equipment, rain gear, goggles, splash shield, welding gloves, cape or chaps
Level C	**Mandatory Equipment** Hardhat, Safety Toed Boots, Safety Glasses, Long Sleeved Shirts, Pants, Reflective Vests, Tyvek, Poly Coated Tyvek or Saranex Coveralls, Respirator with the Proper Cartridge, Gloves (either Work Gloves or Chemical Resistant Gloves), Boot Covers or Chemical Resistant Safety Toed Boots	**Optional Equipment, as Needed** Cold weather Gear, Gloves, hearing protection, fall protection equipment, rain gear, goggles, splash shield, welding gloves, cape or chaps

Sequence of Basic Job Steps	Potential Hazards	Required Controls
[redacted]	Cold Stress	• Personnel will wear appropriate cold weather clothing • During periods of extreme cold exposed skin should be covered • Wet clothing will be removed immediately • Work/rest regimens will be developed and adhered to
	Excessive Noise	• Wear hearing protection when exposed to noise levels exceeding 85 dB(A) 8 hour TWA • Perform noise monitoring when the potential to be exposed to noise levels greater than 85 dB(A) 8 hr TWA exists • Personnel shall be trained in the proper use of hearing protection devices • Post high noise areas • Individuals who work in areas in which 85 dB(A) 8 Hr TWA could be exceeded will be enrolled

		in a medical surveillance program as required
	Slips, Trips and Falls	• Maintain good housekeeping at all times • Ensure adequate lighting • Remove, mark or barricade hazards
	Biological Hazards	• Personnel shall avoid bees, wasps, hornets, mice, snakes, poison ivy and other hazardous insects, reptiles, animals and plants • Personnel will be provided with awareness training on hanta virus prior to beginning work
Sequence of Basic Job Steps	**Potential Hazards**	**Required Controls**
	Inadequate Lighting	• Lighting shall be sufficient (at least 5 foot candles) to allow personnel to perform work in a safe and efficient manner • If lighting is not sufficient, work shall be stopped until sufficient lighting (i e temporary lighting, daylight) is available
	Cuts and Abrasions	• Personnel shall wear gloves when manually handling material with sharp edges • Eliminate or mark sharp protruding objects • Personnel shall be cognizant of pinch points and shall not allow themselves to get into a position between a stationary object and a moving piece of equipment
	Manual Lifting Hazards	• Personnel shall ensure that they observe proper lifting techniques and shall minimize movements such as over reaching, bending and twisting • Personnel shall not lift more than 50 lbs without help from a co-worker(s) or mechanical assistance
	Traffic Hazards	• Personnel shall wear high visibility vests when working within 25 feet of vehicular traffic areas or moving equipment • Vehicle drivers shall obey posted site speed limits, stop signs, wear seat belts and common driving practices

Sequence of Basic Job Steps	Potential Hazards	Required Controls
[redacted]	Mechanical Lifting	• All lifts shall be performed under the guidance of an individual who has completed the RFETS Hoist Apparatus Training • All hoisting and rigging equipment shall be inspected for signs of deterioration • The approximate weight of all items to be lifted shall be know and shall not exceed the rated capacity of the hoisting and rigging equipment or the equipment which is being utilized to perform the lift • All ground personnel shall be in a safe location with respect to the load and rigging prior to any slack in the rigging being taken up • Taglines should be utilized as appropriate • Hands on manipulation of the load shall be minimized to only that required to finely position the load • Personnel shall not be under an elevated load • The CSS shall designate a signal person This shall be the only person giving direction to the operator • The operator shall immediately lower the load and place it in a safe configuration whenever directed to do so • All lifting activities shall be evaluated by the CSS and HSO on a daily basis to ensure that wind speed is at a level which is conducive to safe lifting
	Electrical Hazards	• All electrical power tools and cords shall be inspected prior to use • Power tools shall be equipped with a ground prong or double insulated • Flexible electrical cords shall not be spliced or have insulation repaired with tape • Frayed or worn cords will be immediately removed from service and replaced • Electrical cords and equipment shall be kept out of standing water, except for those devices designed for use in water • Electrical devices shall be equipped with GFCIs • All electrical energy sources shall be isolated and verified prior to working on electrical devices • Proper protective equipment shall be utilized working on electrical systems

Sequence of Basic Job Steps	Potential Hazards	Required Controls
	Mobile Machinery Hazards	• Only properly trained workers shall be permitted to operate heavy equipment • Heavy equipment shall be inspected daily, prior to use and equipped with an audible, working backup alarm • Personnel shall wear high visibility vests when working within 25 feet of vehicular traffic areas or moving heavy equipment • Personnel shall be cognizant of pinch points and shall not allow themselves to get into position between a stationary object and a moving piece of equipment,
	Power Tool Hazards	• All power tools shall be inspected prior to use • Power tools shall be equipped with a ground prong or be double insulated • Power tools shall be used in conjunction with a GFCI • Damaged power tools shall be immediately removed from service • All power tools shall have the appropriate guards in place prior to use
	Fuel Spillage	• Ensure fuel tanks are properly labeled • Use a fuel spout or funnel when fueling • Ensure that there is a proper berm around fuel storage tanks
	Electrical Shock	• Equipment operators will maintain at least 10 feet of clearance between heavy equipment and live overhead electrical lines
	Fire/Explosion	• Fuel storage tanks and flammable storage cabinets shall be properly grounded, • Fire extinguishers shall be located within 50 feet but not closer than 25 feet from all fuel storage tanks and refueling operations
	Excessive Winds	• Wind speed will be monitored by OHM • The HSO shall evaluate each day's tasks to ensure that the current wind speed will not adversely affect OHM's ability to perform work safely
	Excessive Dust	• The HSO shall evaluate the need for dust control on a daily basis • Respirable dust monitoring will be performed as deemed necessary by the HSO>
	Chemical Contamination	• Personnel will be briefed on the hazards of the chemicals with which they may come into contact • The appropriate PPE will be worn when working with chemicals • Personnel and area air monitoring will be conducted at the discretion of the HSO • Personnel shall immediately leave the area and notify the CSS and HSO if chemical staining is observed in the soils

Sequence of Basic Job Steps	Potential Hazards	Required Controls
[redacted]	No additional hazards	[redacted]
	No additional hazards	
	No additional hazards	
	Slips, Trips and Falls	• Personnel working within 6 feet of an unsloped, unprotected excavation greater than 6 feet in depth shall wear ANSI approved fall protection attached to an approved anchorage
	Cave-In	• All trenches will be sloped to a 1 ½ angle of repose or appropriately shored • Standing water will be immediately removed from the trench • Trenches will be inspected by a competent person prior to each work day or when conditions change • Spoils will be located a minimum of 2 feet from the edge of the excavation
	Open excavations	• All necessary permits and approvals will be obtained prior to starting excavation activities • Unattended, open excavations will be demarcated to prevent personnel from inadvertently falling into the excavation • All excavation will be sloped to a 1 ½ angle of repose or appropriately shored • The excavation shall be backfilled as soon as possible upon completion of work in the excavation
	Underground Utilities	• All utilities shall be located and identified prior to excavation • All excavation within 18 inches of underground utilities shall be performed by hand
Sequence of Basic Job Steps	**Potential Hazards**	**Required Controls**
[redacted]	Confined Space Hazards	• The Safety Professional will make the determination of whether or not entry into the excavation is considered a permit required confined space entry • If entry into the excavation is considered a permit required confined space entry, a confined space entry shall be initiated • Prior to entering the excavation, the HSO or Safety Designee will sample for oxygen deficiency, flammable atmosphere, and carbon monoxide • Additional air monitoring shall be performed as deemed necessary by the HSO • All individuals involved with the confined space entry shall be appropriately trained
	Falling Debris	• All spoils shall be placed a minimum of 2 feet from the edge of the excavation • Personnel shall wear hardhats inside the contamination reduction and exclusion zones
	No additional hazards	[redacted]

[redacted]	No additional hazards	[redacted]
[redacted]	No additional hazards	[redacted]
[redacted]	Working From Ladders	• Workers shall not carry materials when climbing or descending ladders • Handlines shall be used to hoist and lower materials • Personnel shall not overreach a ladder to a point where the body is no longer between the side rails • The ladder shall be kept free of mud, ice and snow • Personnel shall maintain at least 3 points of contact when climbing or descending ladders
	No additional hazards	[redacted]
Sequence of Basic Job Steps	**Potential Hazards**	**Required Controls**
[redacted]	Airborne Iron	• Utilize dust control as appropriate • Wear prescribed PPE
	No additional Hazards	[redacted]

APPENDIX 1

OHM

SAFETY AND HEALTH PROFESSIONAL/DESIGNEE

QUALIFICATIONS

OHM's Health and Safety Professional for the East Trench Plume Project is Mr Richard L Barcum Mr Barcum has 8 years of consecutive experience as a Safety Professional in hazardous waste remediation, construction, and the Department of Energy Additionally, Mr Barcum is a Certified Safety Professional-Comprehensive Practice and has a Bachelor of Science Degree in Industrial Science and a Master of Science Degree in Industrial Technology Education-Safety Mr Barcum will be at RFETS during the execution of work and will have responsibility for the management of OHM's Safety and Health Program for all project work at RFETS

Mr Godette will be the Health and Safety Specialist for the East Trenches Plume Project Mr Godette has 4 years of progressive safety and health experience as a Health and Safety Specialist and Industrial Hygienist in the environmental industry Additionally, Mr Godette has 6 years of experience as a safety Technician during the completion of undergraduate studies Mr Godette received his B S degree in Biology/Chemistry with a minor in Environmental Health from the University of Southern Colorado in Pueblo, Colorado Mr Godette is currently pursuing Certified Industrial Hygienist status

OHM is currently in the hiring process with Mr Godette His projected project start date is Monday, February 22, 1999

Ms Judith Blakemore is the proposed interim Health and Safety Specialist for the East Trenches Plume Project Ms Blakemore has 22 years of progressive experience in the environmental industry serving as a Geologist and Safety Expert Ms Blakemore combines her background in geology with her training in health and safety to ensure the safety of work performed in the investigation and remediation of hazardous waste sites This includes serving as field geologist on hazardous waste sites, preparation and implementation of worker health and safety plans, teaching health and safety courses to hazardous waste workers to comply with OSHA regulations and maintenance of health and safety records for the 85-person hazardous waste staff in Parson's Denver office Additionally, Ms Blakemore has a B S in Mathematics from Hofstra University, an M S in Geology from Miami University in Oxford, Ohio and an A S degree in Hazardous Materials Technology from Front Range Community College

Ms Blakemore will be the interim Health and Safety Specialist until Mr Godette can assume the full time responsibilities

Resumes are attached

Richard L. Barcum, CSP, CHMM

OHM Energy Services

Project Summary

12/98 to Present **Rocky Flats Environmental Technology Site, Golden, Colorado**
Safety Manager for the Department of Energy (DOE) Program Management Office which is responsible for the execution of various hazardous waste remediation and general construction projects Projects include relocation of influent/effluent lines at the Modular Storage Tanks, installation of a water treatment system at the East Trenches Plume, and Building 440 upgrades

8/95 to 6/97 **Colorado, Total Environmental Restoration Contract (TERC)**

Safety Supervisor for the U S Dept. Army Corps of Engineers (USACE) TERC which consisted of the remediation of several hazardous waste sites in Colorado Projects included the demolition of buildings contaminated with crystallized explosives, toxic metals and asbestos at the Pueblo Chemical Depot (Pueblo, Colorado), excavation and capping of three (3) landfills at the Fort Carson Army Depot (Colorado Springs, Colorado) and demolition of the above ground tank farm and Submersed Quench Incinerator (SQI) and the remediation of two (2) storage ponds contaminated with pesticides, toxic metals, hydrazine, and ammonia at the Rocky Mountain Arsenal (Denver, Colorado)

4/95 to 8/95 **Johnston Atoll, U.S. Territory**

Safety Supervisor for U S Navy contract which consisted of the removal, stabilization and solidification of approximately 15,000 cubic yards of lead contaminated waste from the Johnston Atoll Solid Waste Burn Pit.

12/94 to 4/95 **Bunker Hill Mine Superfund Site, Kellogg, Idaho**

Safety Supervisor for USACE/U S EPA contract which consisted of the demolition of eighty (80) buildings contaminated with toxic metals and asbestos at the Bunker Hill Mine Superfund Site. This project required regular interaction with the public and media in the form of bi-weekly status Question and Answer (Q&A) sessions in a public meeting format. This project included a Federal OSHA inspection with resulted in no safety and health violations.

11/94 to 11/94 **New London Submarine Base, Groton, Connecticut**

Safety Supervisor for U S Navy contract which consisted of the excavation of soil contaminated with lead, polychlorinated biphenyls, and polyaromatic hydrocarbons at the New London Submarine Base

8/94 to 10/94 **Ames Laboratory, Ames, Iowa**

Safety Supervisor for USACE/U S Dept. of Energy (DOE) contract which involved the excavation of eight (8) landfills, created during research for the Manhattan Project, contaminated with radioactive materials, pyrophoric metals, and asbestos at the Ames Laboratory, including the excavation of over two hundred (200) drums of radioactive waste and pyrophoric metals and over thirty (30) laboratory packs of miscellaneous chemicals This project required regular interaction with the public and media in the form of bi-weekly status Q&S sessions in a public meeting format. This project included a State of Iowa OSHA inspection which resulted in no safety and health violations

6/93 to 8/94 **Weldon Spring Remedial Action Project, Weldon Spring, Missouri**

Safety Manager for DOE contract which consisted of the decontamination and dismantlement of eleven (11) buildings contaminated with radioactive waste and asbestos at the Weldon Spring Superfund Site

NOTE: With the exception of the Weldon Spring, Missouri project, all of the above listed projects were completed ahead of schedule, under budget and with zero (0) OSHA Recordable accidents.

Richard L. Barcum, CSP, CHMM

Summary of Experience

- CSP/CHMM with 8 years of experience effectively developing and managing proactive, comprehensive safety and health programs in a variety of industrial and construction settings
- Extensive knowledge of OSHA, EPA, ANSI and NFPA safety and health standards/regulations.
- Extensive knowledge of OSHA Voluntary Protection Program (VPP)
- Extensive knowledge of Worker's Compensation Law
- Proven ability to effectively communicate goals, objectives and expectations to all levels, including craft (union/non-union) personnel, project management, senior management and clientele
- Responsible, organized self-starter with strong people skills Excellent communication skills

Safety and Health Program Development and Management

- Develop and implement safety and health policies at Rocky Flats Environmental Technology Site.
- Manage safety and health program at Dept. of Energy former nuclear weapons production facility
- Developed, implemented and managed Process Safety Management program at Rocky Flats Environmental Technology Site
- Prepared Site Specific Safety and Health Plans for environmental remediation projects
- Responsible for two (2) successful, surprise OSHA inspections which resulted in zero (0) violations
- Utilize a variety of risk assessment/process safety management tools.
- Effectively managed entry level safety and health personnel, as well as, several safety and health programs, over a six (6) state geographical area for OHM Remediation Services
- Served as Interim District Health and Safety Manager for OHM Remediation Services
- Effectively developed and delivered all required OSHA training, including OSHA 40 Hour HAZWOPER Training.
- Prepared Site Specific Safety and Health Plans for environmental remediation projects.
- Responsible for two (2) successful, surprise OSHA inspections which resulted in zero (0) violations.
- Managed safety and health programs which have accrued over 2 million man-hours worked with zero (0) OSHA recordable injuries or illnesses
- Utilize a variety of risk assessment/process safety management tools.

Management and Administration

- Responsible for the development of entry level safety and health personnel.
- Developed proposals and cost estimates for potential environmental remediation contracts.
- Supervised subcontracts (> $1M) Negotiated subcontract terms and conditions. Negotiated on the essential elements of subcontracts, including change orders.
- Prepared and coordinated subcontract budgets and schedules with project managers, properly allocating necessary funds and work hours

Work History

Safety Manager	IT Group/OHM Energy Services	Denver, CO	12/98 - present
Safety Engineer	Los Alamos Technical Associates, Inc	Denver, CO	6/97 – 12/98
Safety Supervisor	OHM Remediation Services Corp	St. Louis, MO/Denver, CO	6/93 - 6/97
Safety Engineer	EG&G Idaho, Inc	Idaho Falls, ID	8/91 - 6/93

Education

M.S	University of Idaho	Industrial Technology Education, Safety	1995
B S	Northeast Missouri State University	Industrial Science, emphasis in safety	1991

Professional Certifications

Certified Safety Professional - Comprehensive Practice	1997	#15125
Certified Hazardous Materials Manager - Senior Level	1996	#7050

Training

- OSHA Hazardous Waste Supervisor
- Management Oversight and Risk Tree (MORT) Accident Investigator

Mark Godette
[redacted]

Position Desired HEALTH AND SAFETY SPECIALIST

Summary Health and Safety specialist with 4 years of experience in occupational health and Safety management and planning including industrial hygiene and sampling protocol, OSHA regulation, Chemical usage, and employee training. Four years experience as a safety technician in health and safety regulatory compliance.

Experience

Spectrum Services Inc , Denver, Co (1997 to Present)
Industrial Hygienist

- Implement and maintain the Industrial Hygiene function for Spectrum
- Maintain programs and procedures for IH monitoring/sampling for Spectrum, The Pepsi Center, Ocean Journey, and Rocky Mountain Arsenal Projects
- Develop, Maintain and utilized knowledge of relevant Health & Safety regulations, and industry standards to track developments or changes
- Exercised professional judgment in the recognition, evaluation and control of occupational health hazards (Chemical, Physical, Ergonomic, & Physical hazard)
- Evaluate emerging data in toxicology, occupational medicine, epidemiology, safety and environmental sciences

Rust Environment and Infrastructure, Pueblo, Co (1995 to 1997)
Health & Safety Specialist

- Used expert knowledge of scientific principles to provide functional assistance to other Health & Safety team members
- Maintain Corp of Engineer, and OSHA standards, training, and REI safety policy
- Collect and analyze data to determine needs, trends, and patterns
- Assist REI with corporate audits
- Develop and implement remedial plans to address any identified Health & Safety deficiencies for REI, IBM, Chrysler/Dodge, and Samsung Projects

Colorado State Hospital, Pueblo, Co (1990 to 1996)
Safety Tech

- Maintain occupational hygiene program
- Serve as a Health & Safety technical resource
- Interface with health services on Health & Safety issues
- Develop and maintain the hazard communication program
- Collect and maintain the medical surveillance program

Education University of Southern Colorado, Pueblo, Colorado (1995)
B.S., Biology/Chemistry, Minor: Environmental Health

Judith A. Blakemore
Geologist/Safety Expert

Experience Summary

Ms. Blakemore combines her background in geology with her training in health and safety to ensure the safety of work performed in the investigation and remediation of hazardous waste sites This includes serving as field geologist on hazardous waste sites, preparation and implementation of worker health and safety plans, teaching health and safety courses to hazardous waste workers to comply with OSHA regulations; and maintenance of health and safety records for the 85-person hazardous waste staff in ES's Denver office

Years of Experience:

22

Years with Parsons:

5

Education

B.S. in Mathematics, 1975, Hofstra University, Hempstead, New York

M S. in Geology, 1983, Miami University, Oxford, Ohio

A.S. in Hazardous Materials Technology, 1990, Front Range Community College, Westminster, Colorado

Experience

1992-Date Parsons Engineering Science, Inc. Lead Inspector (1995-Date). Performed lead base paint visual inspections and damage assessments in housing units at Randolph Air Force Base, San Antonio, Texas

- Asbestos Inspector (1995-Date) Performed asbestos surveys and sampling in various building types totaling over 600,000 square feet at Altus Air Force Base, Altus, Oklahoma, Randolph Air Force Base, San Antonio, Texas, and Tyndall Air Force Base, Panama City, Florida. Performed ACM condition assessments and material quantity estimates. Generated field data sheets for input into the PCV3 database. Prepared asbestos samples for shipment to the laboratory for analysis
- Geologist (1993-Date). Performs field evaluations to confirm and delineate contamination at hazardous waste sites in Arizona and in Colorado, including the Lowry Air Force Base and Lowry Landfill Superfund site. Responsibilities include soil boring, geoprobe drilling and sampling, piezocone and hydrocone systems, cone penetrometer investigations, hydropunching, monitoring well installation, and soil, groundwater, and surface water sampling.
- Corporate Instructor (1993-Date) Teaches OSHA refresher and confined-space entry training and the Denver office Illness and Injury Prevention Program
- Environmental Scientist (1992-Date) Responsible for administration of the Denver office health and safety program Activities include arranging for tracking of physicals and training requirements, conducting respirator fit tests, maintaining instrumentation calibration logs, coordinating corporate training courses, and preparing health and safety plans Researched and developed a chemical database for corporate-wide health and safety use

- **Site Health and Safety Officer** (1992-Date) Provides construction and hazardous waste site safety oversight, maintains records, logs, and equipment, supervisesand performs confined-space entries, and performs air monitoring, air sampling, RCRA waste characterizations, and waste management. Projects include hazardous waste site investigations and remedial action implementation activities at the Lowry Landfill NPL facility, Pueblo Depot Activity, and other sites in Texas, Oklahoma, New Mexico and Colorado

1990-Date Front Range Community College Westminster, Colorado **Adjunct Professor** (1990-Date) Teaches 40-hour and 8-hour health and safety courses and confined space entry training for work at hazardous waste sites in compliance with OSHA regulations. Also developed supplementary handout material to the OSHA class. Responsible for the groundwater sampling and monitoring portion of the field exercise for the 40-hour course

- Also taught site investigation and sampling field techniques and asbestos awareness and portions of the asbestos worker course according to AHERA and EPA requirements
- **Governor's Job Training Program Coordinator** (1991-1992) Responsible for the organization and administration of the FRCC grant program for the retraining of dislocated and unemployed workers from throughout Colorado into the hazardous material management/environmental field Duties included information intake and processing, qualifying participants, record keeping, coordination of program content and scheduling, supply requisitions, resume revisions, advisement, and job placement
- **Instructional Assistant** (1990-1991) Responsible for various administrative duties, including curriculum development, advisement, transcript evaluation, graduation reviews, resume assistance, job placement assistance, technical editing, class preparation, and coordination of office functions Also responsible for the administration of Governor's Job Training Fast-Track and Scholarship Programs
- **Lab Assistant** (1990) Performed various clerical and essential duties including information intake and processing for the Governor's Job Training Program, and class/lab preparation

1983 Berrong Enterprises. **Geophysicist** Processed geophysical data to support oil and gas exploration in Texas, Oklahoma, and the midwestern United States

1981-1982 Amoco Production Company Denver, Colorado **Geophysicist.** Processed and interpreted geophysical data to support oil and gas exploration throughout the western United States and Alaska.

SPECIAL TRAINING

40-hour OSHA health and safety training with annual 8-hour refreshers for work at hazardous waste sites and the 8-hour training for site supervisors

Confined-Space Entry Training

Hazard Communication Standard Short Course

Emergency Response Technician Level III class in compliance with OSHA standards

Construction Services Health and Safety

Competent Person Course

Certified EPA/AHERA Asbestos Inspector/Management Planner

Lead Abatement Inspector and Supervisor/Contractor

Toxicology and Risk Assessments

DOT Regulatory Training

Hazardous Materials Handling and Transportation

Small Quantity Generator/Waste Minimization Short Course

Low-Cost, Risk-Based Remediation

ASTM Standards Technology Training for Ground Water Monitoring and Sampling

DOE Subcontractor Training for work at the Rocky Flats Environmental Technology Site

Quality Improvement Fundamentals Training

PAPERS AND PRESENTATIONS

Adjunct Professor, Front Range Community College teaching the following

- 40-hour OSHA,
- OSHA refresher,
- Confined-space entry,
- Site investigation and sampling techniques,
- Asbestos awareness,
- Asbestos worker, and
- Introduction to hazardous materials management

Clay Mineralogy and Diagenesis in the Hockingport Sandstone Lentil, Dunkard Group (Pennsylvanian-Permian) in Ohio and West Virginia 1983 Thesis prepared for completion of Masters degree in Geology, Miami University, Oxford, Ohio